DATA PROCESSING DIGEST

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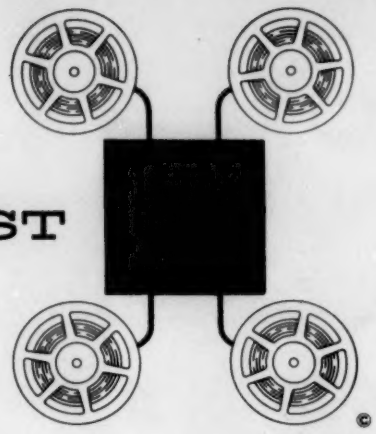

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General Information

PLANNING FOR AUTOMATION

Raymond P. Foley, Peat, Marwick, Mitchell & Co., Seattle, Washington
MUNICIPAL FINANCE, August, 1961; pages 24-28

Municipal administrations are looking to industry for experience in data processing installations. The primary lessons learned revolve around adequate organization, planning and personnel development. It has been found that technical requirements can be provided by the computer manufacturers and outside consultants. One of the most important aspects is the effect on personnel. Even in the offices, the reduction in requirements for less skilled workers will affect concepts of training in high schools and trade schools. Most positions in a highly mechanized office will continue to be filled by high school graduates. Therefore, the special skills required must be defined and these skills must be included in high school and trade school curricula. In some of the higher level jobs--such as tab operators, computer console operators, programers and systems analysts--logic, imagination, mathematical aptitude, and analytical approach are necessary characteristics. High school training to promote these traits might be obtained through courses in mathematics, statistical methods, systems analysis and logic. Also, these schools should provide training in basic machine operations and programing techniques.

Thus far, on-the-job training, found to be necessary in a changeover to automation, has been provided for mostly by equipment manufacturers. However, an adequate program of in-plant employee training should be supplemented by a reoriented high school training for future employees.

Many administrators seem unaware of the amount of coordination and integration needed to make an EDP system function properly. The location of the system in the organization is one aspect of planning for which management is responsible. In some cases it is under the controller's jurisdiction, though often part of a special services section. Sometimes it is a staff department reporting directly to a top level officer. In any case, the manager of the data processing function is in the difficult position of exercising limited functional authority over line departments. This can lead to friction unless he has the ability to use persuasion, or the freedom to appeal to higher authority when bottlenecks occur.

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In some organizations systems design, programing and machine operations are managed under separate supervisors to avoid compromising one function to simplify problems in other functions. However, companies which use a combined approach feel that programers and machine operators cannot fully understand their functions without a full appreciation of the systems requirements. Whatever the organization, it is essential that continuous evaluation of the data processing and the systems be carried on.

The planning stage is the crucial one

Administrators should concern themselves primarily with preparing a sound blueprint for installation and administration. The technical design of the system is a job for technical people. Therefore, the first step is for management to conduct a detailed review of present operations to provide a sound basis for estimating equipment and personnel requirements and to determine the extent of potential advantages to be gained. The design of the system will include input and output requirements, data processing methods, equipment selection, and (very important) progress reporting to management on feasibility, cost estimates, and general results to be achieved.

During the installation period the major problems will appear which are the result of shortcomings in the preparatory stage. This period will also show up problems caused by equipment failures or changes in systems requirements or personnel dissatisfactions. "The installation of advanced data processing systems can provide more operating information on a more timely basis; can produce excellent improvements in efficiency and costs; can meet the challenge of tomorrow's increasing volumes and complexities; can open the door to more advanced and effective management tools. Or it can regenerate a tangle of error and confused records at a high cost in money, employee misery and management embarrassment. The ultimate determining factor is how well the program has been thought out and executed."

DATA—THE CRUCIAL ELEMENT

AUTOMATION, August 1961; pages 54-70

It appears to be the progressive companies which are already advanced in data handling and management techniques where the greatest advances continue to be made in searching for and developing new techniques. "...Utilizing advanced techniques...does not guarantee that significant improvements will be obtained. But not utilizing advanced techniques does guarantee that significant improvements will not be obtained."

Define the system first

Expensive data handling equipment, while important to many of the advanced techniques, is no substitute for a logical management system or enlightened management thinking. "Successful data handling installations demonstrate that components and equipment are applied because a logical system exists--and not that a logical system exists because components and equipment are applied."

Natural data and optional data

Two broad classes of information flow may be defined: 1) the natural data of the organization; 2) the optional data. Natural data includes such information as customer orders, invoices, receipts, payrolls, purchase orders and other information dealing with customer requirements, materials, and money. Optional data includes reports, budgets, statistical studies, historical files, and any other information needed to make the organization function efficiently.

Data needs to be examined for its usefulness. "Some optional practices have become so time-honored or so enmeshed with natural data that they appear to be necessary. Accounting practices, in particular, have a penchant for solidifying with time into set practices."

Expenditures on well-thought-out improvements for the flow and handling of natural data can be justified in a straightforward manner. However, improvements involving optional data must depend first on whether or not the data is needed. Many departments are self-perpetuating. Management must decide what information and what manpower is needed. Progressive management should organize the company structure around objectives rather than around techniques (which is the more common practice).

Is this optional data useful?

In setting up data goals, the usefulness of information should be measured in terms of time. Pertinent information must be put into the hands of appropriate decision-making authorities within time limits that allow the peak potential usefulness of the information to be realized. As much decision making as possible must be reduced to a routine, and these routines must be reviewed periodically and updated before they become outdated and inefficient. Decision aids must be developed to assist in improved decision making. These are techniques which reveal the relationships among variables.

Service, reference, planning, control are information domains

Information flow may be conveniently classified into four domains: 1) The service domain is the handling of natural data, and this kind of data is easily handled by electronic equipment. The key to efficiency here is early transcribing of data into machine usable media. Economies are found in this domain in improved accuracy, time saving, and ease of data transmission and manipulation. 2) The reference domain overlaps the other domains because it is the storehouse for all the data needed. In this area, information may be stored in graphic form as well as symbolic (alphabetic or numeric) form. 3) In the planning domain are found the establishment of goals, and the forms of the organization. Goals for an organization include not only "making a profit" but also market position, productivity, product leadership, personnel development, employee attitude, and public responsibility. Planning includes such techniques as decision and value theory, organization theory, game theory, inventory theory, statistical theory, probability theory, linear programing, queuing theory, sequencing theory, replacement theory, and simulation. 4) The control domain includes all efforts which channel forces and materials toward desired ends. "Management must decide and present well defined objectives within the capabilities of those ordered to do something; and all concerned levels of responsibility must be able to observe progress toward the objective." For acceptable control, reports must be available

at intervals shorter than the time periods for which an authority is responsible. "Thus, if a supervisor is responsible for daily progress, he should be able to draw upon hourly or... minute-by-minute accounts of efforts." If reporting is meant only to show where attention is needed, exception reporting may be the solution.

It should be remembered that written or printed data is not as easily comprehended by humans as graphic representations, and these latter should be used wherever possible. In addition, the benefits of "real-time" administrative systems should be investigated. Although such systems are not widely used, there is an increasing number of such systems being made available on a service basis, giving rise to the suggestion that some day real-time computer systems may become available as a utility, much like electricity or water.

DEVELOPMENTS IN PUBLIC ADMINISTRATION

Geoffrey Y. Cornog, American Society for Public Administration
PUBLIC ADMINISTRATION REVIEW, Spring 1961; pages 105-114

A review of some of the employment ramifications of EDP is given, based on the study by Ida R. Hoos ((See: DPD, September, 1960, page 3; "When the Computer Takes Over the Office")) published by Harvard Business Review in the July-August 1960 issue. Some of the conclusions reached in the article are these: "... ADP will operate to reduce those very functions that have brought on an increasing clerical work force and the future should see a serious problem of white-collar job displacement. In addition, for the same reasons the future should see a continuing movement of ADP into the area of middle management functions and will raise a number of serious problems here. Certainly management training will become an increasing problem and we can probably look for an increase in the importance of the internship and of computer simulation as training techniques.... All except the most unusual and exceptional managements will probably prefer to keep control in their hands, especially in the government service where political repercussions of organization actions are so greatly feared.

WILL WE TALK TO COMPUTERS?

AUTOMATIC DATA PROCESSING, August 1961; pages 23-25

Two computer ideas which will be realized in the near future are computer input systems that will recognize and respond to oral instructions; and systems that are able to learn and improve performance solely on the basis of exposure to external stimuli. Others are undoubtedly being worked on by computer engineers, but are either proprietary or classified information, not to be mentioned publicly.

In the first category above, MIT has developed a computer output that will accurately reproduce spoken commands by different voices 98 percent of the time. Bell Telephone Laboratories have successfully tested a 10-word recognition device that could be used for voice dialing of telephone numbers. RCA built a "phonetic typewriter" in 1956, and Kyoto University of Japan has been working on a similar device. Another type of speech recognition device has been developed by J. Dreyfus-Graf of Geneva.

In the second category mentioned above, the Mark I Perceptron developed by Cornell Aeronautical Laboratory can be trained to identify objects or unusual patterns. Aeronutronic Div. of Ford, General Electric, and Bell Telephone Laboratories are also developing pattern recognition devices.

ELECTRONIC DATA PROCESSING AND ITS POTENTIAL FOR RETAILING

Ethel Langtry, Retail Research Institute, NRMA, New York
COMPUTERS AND AUTOMATION, August 1961; pages 20-23

Optical Character Recognition is the hope of the retail industry. With optical scanning equipment information from sales checks, bill stubs, receiving reports and order forms can be converted into machine language without first going through the manual operation of keypunching. Optical scanning can also be used to read cash register tapes and similar tapes for conversion of classification, sales audit, and payroll data into machine language. In time, transports will be built to handle merchandise tickets similar to those presently used, and to convert this information into machine language.

The controller is the person in a retail establishment who should be responsible for liaison between the equipment manufacturers and the retail management, and the controllers should evaluate technical features of equipment offered for retail use before applying them to their business. To do this, the controller must have an understanding of the functions of the various pieces of equipment, the advantages and disadvantages of various competitive products.

Data originates on the selling floor

The sales clerks are the people responsible for originating the data required for sales audit, accounts receivable, and compilation of statistics. Often these people resent the bookkeeping chores required by them, viewing them as a nonproductive function. For a retail organization to afford EDP, a workable system must contain these elements: 1) it must either pay for itself in a reduction of personnel or operating cost, or produce increased operating efficiency in the merchandise area; 2) the capital investment must be a sound one; 3) the system must be simple enough to operate on the selling floor; 4) the system must be as foolproof as possible because so many people are involved in the origination of data.

In retailing, the total amount allowed for control and accounting functions, including accounts receivable is 1.55 percent of sales. This is the amount within which any "saving" through the use of EDP must be included. No doubt some customer contact functions will increase in cost through the introduction of EDP since, at least in the initial stages, bill adjustment costs will go up. Therefore, EDP is no answer for an inefficient operation. Controllers must be willing to break with tradition and accept what seem to be new and radical approaches to the processing of data. One of the new areas will be Merchandise Management Information. Through the use of punched merchandise tickets which accompany goods shipped by the manufacturer, stock control and merchandising reports can be prepared to assist buyers and merchandise managers to keep up with selling activity. However, these reports will not be used if they are merely long lists of selling data. It is far easier for the buyer to look at a rack to see which item is selling out quickly. Reports prepared for their use should indicate only those items on which they must take action--that is, exception reporting. In this respect, retailing has lagged behind other industries.

It is up to the controller to "take the leadership in devising bold innovations including the introduction of data processing, operations research techniques, and long range merchandise information planning programs."

RETAIL RESEARCH INSTITUTE EDP UP-DATING SERVICE

This monthly report contains information of interest to retailers who are considering establishing EDP systems. The issue dated August 15, 1961 is an equipment chart covering the large systems, magnetic tape, punched card and paper tape equipment, printers, and the operating characteristics of the various models. The report is issued primarily for retailers. For information about obtaining a copy, write to: Retail Research Institute, National Retail Merchants Association, 100 West 31st Street, New York 1, New York.

OPTICAL CHARACTER RECOGNITION APPLIED TO PHONOTYPY

Dr. Vernon W. Stone, Maryland State College
DATA PROCESSING (U.S.), August 1961; pages 38-42

It is suggested that, with some revision of the standard stenotype code, the paper tapes made by the stenotypist can be used as input to a computer via optical reading for faster and more accurate transcription. While the necessary revisions to the code (including complete punctuation, spelling and capitalization will result in longer tapes, the faster transcription time by the computer will make up for any loss in time. Evidence of the author's careful working out of the scheme is seen in the many detailed illustrations of the codes and the changes necessary to implement their use in EDP which are included in the article.

PROGRESS IN INSTALMENT LOAN PROCESSING

William G. Milburn, Mellon National Bank and Trust Co., Pittsburgh, Pa.
AUDITGRAM, August 1961; pages 8-14

Banks have tended to try other processing jobs on their EDP equipment before trying installment loan processing, therefore the experience with this application is not lengthy. However, the increasing volume of installment loan processing indicates that this work will have to be done increasingly by means of EDP equipment.

Built-in tests for accuracy and timely information

In processing installment loans, certain tests should be built into the program. These may be as extensive as desired, but some tests which might be included are these: checking for discrepancies in coding, legality of the rate, term, first payment date, bank charges, dealer's reserve, etc. Certain tests should be made concerning payment. For example, if it is a payment on a delinquent loan, the collection people should be notified; if it is an extension on the loan, the fee should be properly calculated and the extension should be checked to make sure it is within the bank limits; a payment of late charges should be checked for attempted payoff; if the payment will pay off the loan and produce a rebate, the computer should be programed to perform the payoff and the rebate; etc.

In discussing various types of computers, the author mentions one drawback of disc storage: the fact that the information is invisible (opposed to the visibility of punched card system records). How to get the information that is needed in visible form is a problem which must be solved.

What kind of payment coupons?

Another problem to be solved is the payment coupons. Two kinds are suggested. A paper coupon with pertinent information perforated at the top is presented with the payments. The coupon is run through a reader for conversion to cards or paper tape input. Such a reader may, in the future, be able to convert information directly to magnetic tape. The second possibility is the use of MICR on coupons, just as it is used on checks.

EDP can help auditors in the loan processing function through the automatic tests built into the program, as well as audit checks and printouts required by the auditing department. In addition, the equipment may be programed to produce its own verifications, if desired. The machine can perform many clerical functions in the auditing process, leaving the auditor free to appraise the loan's compliance with procedures, collateral, collection activity, and other complicated areas. The auditor's role thus becomes more one of "assuring the bank of adequate control and proper documents, understanding programs and systems, and testing programs for audit checks to determine that the established audit features have not been altered or eliminated from the programs."

BANK OF AMERICA'S NEW TRAVELERS CHEQUE

UNITED STATES INVESTOR, August 14, 1961; pages 5,6

The Bank of America is using its ERMA in processing B of A travelers checks. The checks are numbered at the bottom with magnetic ink in the MICR code. Sales of its travelers checks to banks which sell them are processed automatically, using the ERMA system and paper tape input containing the sales information. Sales follow-up is also handled automatically by ERMA, including a forecast of customer needs and the automatic handling of claims and discrepancies.

BANKS COLLABORATE TO SECURE THE ADVANTAGES OF COMPUTER USAGE

JOURNAL OF MACHINE ACCOUNTING, August 1961; pages 55, 56

A group of seven banks in San Antonio, and a group of three banks in Texas City, Texas, have formed two computing services to serve their respective banks. A total of three Burroughs Visible Record Computers has been ordered. Daily documents receipts and customer records of the member banks will be transferred to the centers at the close of each banking day for processing. The updated records will then be transferred back to the home bank before the bank opens the following morning. Each bank will have its own employees in charge of processing its own runs. The centers are expected to be operating sometime in 1962.

HOW DATA PROCESSING AFFECTS CREDIT DEPARTMENT OPERATIONS

Richard Sanzo, Dun & Bradstreet
THE CONTROLLER, August 1961; pages 396-398

In conventional bookkeeping systems, credit information is found on the customer's ledger card. In an electronic system this visible record is very likely to vanish. This information may be provided automatically by the computer system if it is programed to do so. Information can be printed out on punched cards or other permanent records. Or a facsimile posting machine can produce the data, by working in conjunction with the electronic tabulator. The facsimile posting machine takes a printed roll of the transactions punched on the summary card and through a special type of spirit ink makes it possible to imprint the account information on a separate ledger card which is held by the credit department.

As an alternative to facsimile posting, the credit department can receive cumulative trial balances at two, three, or four months intervals. While the company may not know the exact credit position of accounts between trial-balance periods, the frequency of the trial

balances more than compensates for this lack. Some credit men clip information from the trial balance onto account cards for use in answering inquiries. Some rely on the trial balance record from the last month. Others set up individual card files on which they record monthly information.

AID FOR EDUCATION & TRAINING

AID stands for auto-instructional devices, and is the name of a new publication devoted to news about automatic teaching and equipment. The publisher is the Institute of International Research and Development, Inc., an organization which also conducts training courses in auto-instructional programing. Persons who are interested in this field will probably find much of value and interest in AID. Price is $5.00 for 12 monthly issues. Write to: AID, Subscription Dept., P. O. Box 4456, Lubbock, Texas.

THE COMPUTER JOURNAL—CONFERENCE ISSUE

July 1961

A Conference on Data Transmission, Document Handling, and Character Recognition was held by the British Computer Society in cooperation with the Northampton College of Advanced Technology, in London, March, 1961. This issue of the COMPUTER JOURNAL contains the complete conference proceedings. Subjects of the papers and discussions included: problems of standard data transmission; future transmission needs (communications come under the General Post Office jurisdiction in Great Britain); error detection and correction; a report on the IBM SABRE Airlines Reservation system; character recognition systems and equipment; the use of computers in documentation; a description of the DORIS order proc- system; organization of a computing service; and several mathematical treatises. ((DORIS is a specially designed piece of equipment installed by the marketing division of the Shell and British Petroleum Companies in England. See DPD: January 1961, page 7; "Push Button Office."))

Management Sciences

WHY MANAGEMENT GAMES?

Francis M. Webster Jr., Chrysler Corp.
DATA PROCESSING (U.S.), August 1961; pages 9-13

After a description of the better known management games, the author suggests some benefits derived from using the games. "Management games designed to fulfill a particular purpose can convey certain specific training in a dynamic situation. Only through such a technique can the trainee test his decisions, based on his analysis of the environment, and be faced with the real world problem of living with the outcome in making future decisions. The general management game can provide the executive with an opportunity to engage in decision making in areas not directly related to his specific task in his current real world assignment.... He can practice analyzing an environment and planning action in a dynamic situation where a mistake is not costly as it is in the real world.... The executive will benefit from the research being conducted via the game technique....[and]be able to test certain decisions prior to committing resources."

THE COMPUTER MANUFACTURER'S ROLE IN MANAGEMENT GAMES

Burt Nanus, Remington Rand Univac
DATA PROCESSING (U.S.), August 1961; pages 19, 20

Computer manufacturers can offer four services for organizations using management games: 1) they can build games and provide instructions on using them; 2) they can help the company to build its own specialized games; 3) they can provide computing facilities for management groups who would like to use games; 4) they can conduct research on new uses for the technique.

Applications

COUNTY COMPUTER ITEMIZES TAXES

BUSINESS AUTOMATION, August 1961; pages 30-32

DuPage County, Illinois has programed its IBM 1401 (originally done on punched card equipment) to print out on each taxpayer's bill the breakdown in actual dollars and cents to account for every penny of his own personal tax bill. Both the rate and the actual amount of the taxes for each expenditure are listed. The top of the bill is returned with the payment. The bottom, listing the expenditures, is retained by the tax payer for his records. The County Treasurer feels this is a big step in educating the taxpayer in the affairs of government. The county began experimentally with 3500 taxpayers, will now expand the service to handle 234,000 tax bills with the new IBM 1401. Here are just three of the 18 items listed on the example tax bill in the article which show what portion of this taxpayer's taxes has gone for each county expense:

TAXING BODY	RATE	AMOUNT
County Health Dept.	.038	$ 8.90
Township Poor Relief	.048	11.25
Grade School No. 10	1.883	441.21

COMPUTERS PREDICT SALES

Arthur A. Katz, RCA EDP Division
BUSINESS AUTOMATION, August 1961; pages 20-24

RCA has been using its computer to forecast national sales, some of which have achieved accuracy within two percent. Some of the benefits of sales forecasting are the opportunity to take advantage of economic order-quantity purchasing or economic production runs, improved production planning, reduction of overtime and employee turnover, and reduction of inventory investment, along with efficient flow of cash.

RCA has developed a computer method which investigates the correlation possibilities of a given set of indices, and selects and weighs the most significant factors. This method is part of an open-ended feedback system which gives management evaluation a dominant role. The system is begun by the model-maker, a member of management's forecasting group, who submits a rough approximation to the computer by selecting a historical series of indices such as population or GNP. This selection is based on the model maker's experience and skill and reflects his judgment of which indices affect the company's sales.

The computer statistically selects from this data those indices which most closely resemble the historical sales pattern of the company. The resulting forecast is then compared with actual past sales and is projected forward. Management then examines this model by comparing it with certain criteria. For example, they may withhold the previous year's sales from the computer input, then see how well they would have been forecasted by the model. If the comparison shows a deviation, the model maker can submit a new set of indicators, change the present set, provide different combinations of indices, or make other modifications. This data is then re-cycled through the computer and the ensuing output is examined. Management continues to build models in this way until the resulting models appear to be a true reflection of the market. This is essentially the way in which RCA built the model of the election patterns which forecast the 1960 election returns.

FOUR YEARS LATER—IT'S TAKEN FOR GRANTED

AUTOMATIC DATA PROCESSING, August 1961; pages 26-29

More than four years ago the City of Norwich, England, installed an electronic computer for figuring rates (taxes) on property, and water rates. The system has been quietly working efficiently at its task, and has now become enlarged to four times the internal storage capacity, with three magnetic film mechanisms instead of two. Originally, the rate demand note operation took nearly 200 hours. This time has gradually been reduced to the present 42 hours. More and more jobs are being done on the system, and the newest applications will be an extensive costing procedure.

Programing

AN INDIRECT CHAINING METHOD FOR ADDRESSING ON SECONDARY KEYS

L. R. Johnson, IBM Corp., Yorktown Heights, New York
COMMUNICATIONS OF ACM, May 1961; pages 218-222

((This quite technical article for programers describes a way of "chaining" to save searching time and file size in random access memories. Our simplified explanation of the method follows."))

Let us use as an example an employee file which includes the employee's number as the primary key (i.e. by which the records are filed). Any number of secondary keys may be used for searching. For example, in searching for all the employees who may become eligible for retirement during the next year, it would be necessary to search through the secondary key for ages and find all employees who

are now 64 years old. To search each file and test the portion containing the age code would be a time consuming operation. Instead, an artificial addressing system can be used. For example, suppose the desired number (64) is altered by squaring it, giving us the number 4096. This number is used as the address of the entrance record for the entire list of persons who are now 64. 4096 may be the employee number of an employee who is not 64, but there is within each employee's record two locations (let us call them C and D) which provide for the chaining addresses. When the address 4096 is found, the location D is read. This will be the address of the first employee of age 64, i.e. the beginning of the age 64 list. Let us say this employee's number (address) is 1736. In this record, find position C, which will be the employee number of the second person on the age 64 list. Positions C and D may be used, in this example, for each secondary field where such indirect chaining is desired. On the average, 2.5 probes are needed to find a desired record.

COMPUTER PROGRAMMING FUNDAMENTALS

Herbert D. Leeds and Gerald M. Weinberg, IBM Corporation
McGraw-Hill, 1961. Price: $8.50

This is a very good introductory text on computer programing, based on the IBM 7090. The fundamentals necessary for understanding the functioning and purpose of a computer are well defined in the early chapters. The programing concepts are introduced gradually and very clearly, with many examples, charts, and diagrams to guide the way. Several references to Alice in Wonderland, in addition, may help to clear up statements made in that classic by the inscrutable Mr. Lewis Carroll. Except for one omission, we find this an altogether satisfactory introduction to programing, and think it will find good service in many a beginning class in this complex subject. The omission is English language programing; the discussions are confined in general to symbolic and macro-instructions. However, among the advanced subjects included are trapping, indirect addressing, overlapping operations, symbolic debugging, and supervisory programs.

Equipment

NEW ELECTRONIC BRAIN

UNITED STATES INVESTOR, August 21, 1961; page 7

The Provident Institution for Savings, Boston, Mass., has placed its 130,000 accounts on a new system called "Telletron" designed especially for Provident by Stone Laboratories. The system consists of a large electronic memory connected to present tellers' posting machines by a series of control units. In two-fifths of a second (or up to nine seconds if as many as 30 tellers simultaneously query the memory) the Telletron provides the teller stationed at either the home office or one of the branches with complete visual display of any account.

Machine Linguistics

A TABLE LOOK-UP MACHINE FOR PROCESSING OF NATURAL LANGUAGES

J. L. Craft, E. H. Goldman, W. B. Strohm
IBM JOURNAL OF RESEARCH AND DEVELOPMENT, July 1961; pages 192-203

The basic problem in automatic translation is to establish "equivalence between the signs (i.e., words, phrases, sentences) of two different languages." An attempt to solve this problem is described in this article: an Air Force experimental language-processing machine which uses table look-up operations, and based on the photographic memory invented by International Telemeter Corporation. The method has been tested and used in translating Russian technical articles and newspapers into rough English. Its most important features are "a large high-speed random-access dictionary and novel addressing features. Most important of its present features are those which a) determine the longest possible match, b) condition some searches upon the information retrieved in previous searches." Development of syntactic and contextual analysis is now under way.

MACHINE TRANSLATION—A REVIEW AND ANALYSIS REPORT

Lt. Col. D. A. Kellogg, Office of Research and Development, Dept. of Army

This report summarizes foreign as well as domestic accomplishments in machine translations, including projects sponsored by the U.S. Air Force, National Science Foundation, Central Intelligence Agency, the Army and the Navy, universities and corporations.

The report states that analyses word interrelations and order for 95 percent of all sentences is a definite possibility in the next six months. Copies of the report may be ordered from the Office of Technical Services, U.S. Department of Commerce, Washington 25, D.C. Ask for ARO Report No. 4. Price, 50 cents.

PROCEEDINGS OF THE NATIONAL SYMPOSIUM ON MACHINE TRANSLATION

H. P. Edmundson, Editor
Published by Prentice-Hall, Inc. 1961. $7.95

The National Symposium on Machine Translation was held in February, 1960, at the University of California at Los Angeles. It was attended by a distinguished group of persons working in the field of machine translation. The papers and discussions which comprised the symposium are well presented in this book. The discussions come out with a flavor of the lively and often heated participation on the scene, but without the extraneous and meaningless sallies often left in the transcripts of such meetings. This indicates careful and judicious editing, a welcome ingredient which helps make this a successful record of an important event. The papers cover government and private industry research in machine translation, problems of syntax and grammar, construction of glossaries and dictionaries, and methods of search and information processing.

Information Retrieval

IBM: DIGGING UP INFORMATION FROM MILLIONS OF PAGES ON FILE

PUBLISHERS' WEEKLY, August 7, 1961; pages 62-64

A WALNUT FOR INFORMATION RETRIEVAL

DATA PROCESSING, August 1961; pages 26, 27

IBM at San Jose has demonstrated their WALNUT system, for storing and retrieval of information. The system was designed for the Central Intelligence Agency to hold 99 million documents in a file unit. The documents are first microfilmed and then further reduced in size and transferred to strips of film containing 99 images. As the image is transferred to the film strip, control cards are automatically punched to record its location in the file. Each storage bin is equivalent to about 3000 average size books. The system can accommodate about 100 of the bins.

The user begins his search by writing on a form key "search words" such as a name of a person, an object, or a quality like "creativity." Punched paper tape made from the form is placed in the machine and the search through the index begins. A list of index entries corresponding to the documents found by the key words is printed out and returned to the user. The user selects from the list the appropriate items and pulls corresponding punch cards from a file. The punched cards include a blank film insert. These cards are inserted into the document file which reads the location from the punched card and brings the film strip containing the document into lens position. The card's film insert is automatically exposed and developed by a dry heat process in about one-half second for each operation. The card is then returned to the user for enlargement for printing or viewing.

Comment

AUTOMATIC PROGRAMING—PART III

The Compiler Status Report shown on next page is the third in our series of Comments on Automatic Programing. Part I was published in the June 1961 issue, and Part II in the July 1961 issue. This information was requested from the manufacturers listed, and all dates given were their schedules as of June 1, 1961.

COMPILER STATUS REPORT (as of 1 June 61)

	Model	COBOL Due Dates Version	Manual	Compiler	Versio
Bendix Computer Div.	G-20	-	-	1962	-
Burroughs Corp.	B-220	-	-		Broughs Abraic C
	B5000	COBOL 61 sub-set 5000 system	Sept. '61	with 1st deliv-ery - 1962	AOL 60 s se000 sys
Control Data Corp.	CDC1604	61	Preliminary Dec. '61	Field test Feb. '62	PCO
General Electric Co.	GE225	GECOM	A	Sept. '61	AOL (2)
Int'l Bus. Mach.	1401	COBOL Translator	A	1st Qtr. '62	-
	1410			4th Qtr. '61	-
	7070 series				-
	709/7090				AOL (3)
	7080				-
Minn.-Honeywell Regulator Co.	MH-400	COBOL	1st Qtr. '62	End '62	Abraic Co
	MH-800	COBOL	1st Qtr. '62	End '62	
		FACT	A	Summer '62	-
National Cash Register Co.	NCR315	NEAT-COBOL (315) (61)	May '61	Jan. '62	UNEAT
	-	-	-	-	-
	NCR 304A	NEAT-COBOL (304)	May '61	July '61	UNEAT (
Philco Corp.	2000 series	COBOL	-	Oct. '61	-
Radio Corp. of America	RCA 301	301 COBOL Narrator	June '61	1st Qtr. '62	3 cientifi Ireter (
	RCA 501	501 COBOL Narrator	A	A	5 cientifi Ireter (
Remington Rand UNIVAC	UNIVAC II	COBOL-60	A	A	-
	UNIVAC III	COBOL (61)	Jan. '62	Dec. '62	N
	USS 80	COBOL (61)	Nov. '61	Nov. '61 (6)	URAN (5)
	UNIVAC 490	COBOL (61)	Apr. '62	Sept. '62	N

REFERENCES

1. "Revised Report on Common Language" (with "Schedule for Development of COBOL-61 Compilers"); Dept. of Defense, Office of Public Affairs, News Release No. 596-61, June 15, 1961

2. "Automatic Programing Today" Part I, Data Processing Digest, June 1961, page 15; Part II, Data Processing Digest, July 1961, page 19.

Additional information for these reports was gathered from various computer manufacturers.

	ALGOL Due Dates		OPERATING SYSTEM		
Version	Manual	Compiler	Name	Manual	Program
-	-	-	-	-	-
oughs	A	A	-	-	-
braic Comp.					
OL 60 sub-000 system	A	With first delivery	Master Control	Partial in other manuals	With 1st delivery
CO	-	Experimental only - A(1)	Automonitor	June 61	In field test
OL (2)	-	-	Not named	July 61	July 61
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
OL (3)	Under development with customers		SOS, FAP, IB, (4)	A	A
-	-	-	-	-	-
raic Compiler (5)	Fall '61	Summer '62	Not named	1st Qtr. '62	4th Qtr. '61
"	A	A	Executive system	A	A
-	-	-	-	-	-
NEAT	-	-	STEP	-	Oct. '61
-	-	-	CRAM	Aug. '61	May '61
NEAT (304)	July '61	Not known	STEP	A	A
-	-	-	-	-	-
cientific	May '61	Jan. '61	301 Insertion	Oct. '61	Not known
preter (5)			Routine		
cientific	A	A	501 Sequencer	A	Not known
preter (5)					
-	-	-	-	-	-
	-	-	CHIEF	Sept. '62	Aug. '62
RAN (5)	July '62	June '62	None planned		
	-	-	REX	Jan. '62	Apr. '62

NOTES

(1) ALGOL goal Feb. '62
(2) GECOM may be useful
(3) Plus FORTRAN
(4) Plus Report generator, input/output control
(5) Not ALGOL, equivalent
(6) Compile COBOL-60 on UNIVAC II available

Note: Dates prior to Sept. '61 mean the item was scheduled for release; it may be delayed.

A = Available

Training

Computer Management Seminar, One-day seminars, sponsored by Philco Corporation

Date: October 10, 1961; October 24, 1961; November 2, 1961
November 21, 1961; December 5, 1961; December 19, 1961
Place: Philco Computer Center, Willow Grove, Pa.
Information: C. A. Leventhal, Manager, Computer Education, Philco Computer Division, 3900 Welsh Rd., Willow Grove, Pa.

Electronic Data Processing for Business and Industry, Course #10, presented by Richard G. Canning

Date: October 23 through 27, 1961
Place: New York City (Hotel Warwick)
Fee: $250 (includes all class materials and lunch each day)
Information: Richard G. Canning, 614 S. Santa Fe Ave., Vista, California

Teaching Machine Workshop, presented by Los Angeles County Teachers Association

Date: October 28, 1961
Place: Hawthorne High School, Hawthorne, California
Information: Mrs. Lucille Meyers, 3638 S. Carmona Ave., Los Angeles 16, California

1962 Engineering and Management Course, sponsored by UCLA Engineering Extension

Date: January 22 through February 1, 1962
Place: University of California at Los Angeles
Fee: $450 (includes all class materials, lunch each day and closing dinner)
Information: W. Clare Ennis, Assoc. Coordinator, The Engineering and Management Course, College of Engineering, Room 6266, University of California, Los Angeles 24, California

Meetings

Electronic Data Processing Symposium, sponsored by Electronic Engineering Association and Office Appliance and Business Equipment Trades Association

Date: October 4-6, 1961
Place: London, England (National Hall, Olympia)

International Systems Meeting

Date: October 8-11, 1961
Place: Cleveland, Ohio (Hotel Statler and Hotel Pick-Carter)
Program: "Systems Management in Transition"
Information: Systems and Procedures Association, 817 Penobscot Building, Detroit 26, Michigan

NMAA Division 5 Annual Conference
Date: October 12, 13, 1961
Place: Indianapolis, Indiana (Marott Hotel)
Information: NMAA Conference, P. O. Box 256, Indianapolis 4, Indiana

Univac Users Association Fall Conference
Date: October 12, 13, 1961
Place: Philadelphia, Pa. (Warwick Hotel)
Information: Walter Edmiston, Secretary, Univac Users Association, Philadelphia Naval Shipyard, Philadelphia 12, Pennsylvania

USE Meeting
Date: October 10-13, 1961
Place: Philadelphia, Pa. (Warwick Hotel)
Information: J. W. Nickitas, Secretary, USE, Remington Rand Univac, 315 Park Avenue South, New York 10, New York

"Application of Digital Computers to Automated Instruction," sponsored by System Development Corp. and Office of Naval Research
Date: October 11-13, 1961
Place: Washington, D.C. (Dept. of Interior Auditorium)
Information: Washington Liaison Office, System Development Corp., 1725 Eye Street, N. W., Washington 6, D.C.

Forum on Electronic Computers, sponsored by Joint Committee on Continuing Legal Education of the American Law Institute and the American Bar Association.
Date: October 19-21, 1961
Place: Chicago, Illinois (Pick-Congress Hotel)
Information: John E. Mulder, Esquire, Director, The Joint Committee, 133 South 36th Street, Philadelphia 4, Pennsylvania

Computer Applications Symposium, sponsored by Armour Research Foundation
Date: October 24, 25, 1961
Place: Chicago, Illinois (Terrace Casino, Morrison Hotel)
Information: Robert B. Brausch, Armour Research Foundation, 10 West 35th Street, Chicago 16, Illinois

NMAA Electronic Business Systems Conference, sponsored by NMAA Western Div.
Date: October 25-27, 1961
Place: Long Beach, California
Information: NMAA Western Division, P. O. Box 7365, Long Beach, California

Institute on Electronics in Management, sponsored by The American University
Date: October 30--November 3, 1961
Place: The American University, Washington, D.C.
Information: Prof. Lowell H. Hattery, Director, Center for Technology and Administration, The American University, 1901 F Street, N. W., Washington 6, D.C.

GUIDE International (IBM large-scale computer users)
Date: November 8-10, 1961
Place: Cincinnati, Ohio (Netherland Hilton Hotel)
Information: E. F. Cooley, The Prudential Insurance Co. of America, Newark, New Jersey

TIMS-ORSA 2nd National Meeting

Date: November 8-11, 1961
Place: San Francisco, California (Jack Tar Hotel)
Information: The Institute of Management Sciences,
Box 273, Pleasantville, N. Y.

ACM Technical Symposium sponsored by Los Angeles, Orange County, and San Fernando Valley Chapters of ACM

Date: November 21, 1961
Place: Santa Monica, California (Miramar Hotel)

1961 Eastern Joint Computer Conference

Date: December 12-14, 1961
Place: Washington, D.C. (Sheraton-Park Hotel)
Theme: Computers--Key to Total Systems Control

Forum on Electronic Computers, sponsored by Joint Committee on Continuing Legal Education of the American Law Institute and the American Bar Association

Date: December 14-16, 1961
Place: Los Angeles, California (Statler-Hilton Hotel)
Information: John E. Mulder, Esquire, Director, The Joint Committee,
133 South 36th Street, Philadelphia 4, Pennsylvania

References

DATA PROCESSING DIGEST does not provide copies of the original material digested or reviewed in this issue. The publishers' addresses are listed below for your convenience in writing to them for more complete information.

Auditgram
38 S. Dearborn St.
Chicago 3, Ill.

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Mercury House
109-119 Waterloo Rd.
London SE 1, England

Automation
Penton Building
Cleveland 13, Ohio

Business Automation
600 W. Jackson Blvd.
Chicago 6, Ill.

Communications of A. C. M.
1 East 69th St.
New York 21, New York

The Computer Journal
The British Computer Society
Finsbury Ct, Finsbury Pavement
London EC 2, England

Computers and Automation
815 Washington St.
Newtonville 60, Mass.

The Controller
Two Park Ave.
New York 16, New York

Data Processing
22nd Floor, Book Tower
Detroit 26, Mich.

IBM Journal of R & D
590 Madison Ave.
New York 22, New York

Journal of Machine Accounting
1750 W. Central Rd.
Mt. Prospect, Ill.

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330 West 42nd St.
New York 36, New York

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1513 East 60th St.
Chicago 37, Ill.

Prentice-Hall, Inc.
Englewood Cliffs, New Jersey

Public Administration Review
6042 Kimbark Ave.
Chicago 37, Ill.

Publishers' Weekly
3rd and Hunting Park Ave.
Philadelphia 40, Pa.

United States Investor
286 Congress St.
Boston 10, Mass.

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